

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of enhancing fluid velocity in a pipeline, comprising the step of:

providing pipeline pigs that block fluid flow through the pipeline by forming a seal with an inside surface of the pipeline;

providing means an electromagnetic thrust system on the pipeline to provide propulsion, guidance and suspension for the pipeline pigs to propel the pipeline pigs along the pipeline independent of fluid pressure, the electromagnetic thrust system including coils on the pipeline which interact with the pipeline pigs; and

propelling the pipeline pigs sequentially through the pipeline containing fluid at speeds in excess of that provided by a pressure system for the pipeline, such that the fluid is pushed by the pipeline pigs and fluid is drawn by areas of low pressure created by the passage of the pipeline pigs through the pipeline.

2. (Previously presented) The method defined in Claim 1, the pipeline pigs being propelled at speeds which are a multiple of a fluid speed provided by the pressure system for the pipeline, thereby multiplying the capacity of the pipeline.

3. (Original) The method as defined in Claim 1, the fluid in the pipeline being one of a liquid, a gas, a slurry or a fluidized solid.

4. (Withdrawn) The method as defined in Claim 1, container capsules being concurrently moved through the pipeline by the pipeline pigs.

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5. (Withdrawn) The method as defined in Claim 4, the pipeline pigs being modified to serve as container capsules.

6. (Canceled)

7. (Currently amended) The method as defined in Claim [[6]]1, the electromagnetic thrust system including electromagnetic motors, the electromagnetic motors being one of linear synchronous motors, linear motors, linear induction motors, linear electrodynamic motors, and pulsed linear induction motors.

8. (Currently amended) The method as defined in Claim [[6]]1, magnets being incorporated into the pipeline pig.

9. (Original) The method as defined in Claim 8, the magnets being one of permanent magnets, electromagnets, induction magnets, and superconducting magnets.

10. (Currently amended) The method as defined in Claim [[6]]1, the pipeline pigs being one of rigid body, magnetorheological fluids (fluids that harden in the presence of a magnetic field and becomes liquid again when the magnetic field is removed), and ionized slugs of fluid.

11. (Canceled)

12. (Currently amended) The method as defined in Claim [[11]]1, the coils being configured in one of multi-layered, pancake, flat plate or diamond.

13. (Currently amended) The method as defined in Claim [[11]]1, the coils incorporating ferromagnetic materials.

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14. (Currently amended) The method as defined in Claim [[11]]1, the coils being applied to an outside of the pipeline.

15. (Original) The method as defined in Claim 14, the coils being oriented in one of the following orientations: parallel to a longitudinal axis of the pipeline or fully encircling the pipeline perpendicular to the longitudinal axis of the pipeline.

16. (Withdrawn - currently amended) The method as defined in Claim [[11]]1, the coils being embedded in a pipeline liner.

17. (Currently amended) The method as defined in Claim [[6]]1, a power source being used that is one of alternating current or direct current.

18. (Original) The method as defined in Claim 17, the power source being provided by one of connecting to an electric power grid or by generating the appropriate power adjacent to the pipeline.

19. (Original) The method as defined in Claim 18, a combination of transformer(s), rectifier(s), chopper(s) and inverter(s) being used to condition the power from the power source to provide multi-phased, variable voltage, variable frequency power.

20. (Currently amended) The method as defined in Claim [[11]]1, a switching system being incorporated into the coil system such that energization of the coils is done in such a manner as to appropriately propel / suspend / hold the pipeline pigs and minimize power consumption.

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21. (Currently amended) The method as defined in Claim [[6]]1, an electromagnetic holding zone is provided to load the pipeline pigs into the pipeline while preventing fluid flow through the holding zone.

22. (Previously presented) The method as defined in Claim 1, the pipeline pigs being propelled for a substantial distance along the pipeline.

23. (Previously presented) The method as defined in Claim 1, the pipeline pigs being propelled only at selected locations where it is desirable to increase fluid velocity or pressure.

24. (Withdrawn) The method as defined in Claim 1, a pipeline pig return line being provided.

25. (Currently amended) An apparatus for enhancing fluid velocity in a pipeline, comprising in combination:

pipeline pigs that block fluid flow through a pipeline by forming a seal with an inside surface of the pipeline;

a pipeline having holding zone to load the pipeline pigs into the pipeline while preventing fluid flow through the holding zone and a separation zone in which the pipeline pigs are removed from the fluid flow; and

an electromagnetic thrust system on the pipeline to provide propulsion, guidance and suspension for the pipeline pigs including coils on the pipeline which interact with the pipeline pigs means for propelling the pipeline pigs sequentially through the pipeline containing fluid at speeds in excess of fluid flow provided by a pressure system for the pipeline, such that the fluid is pushed by the pipeline pigs and fluid is drawn by areas of low pressure created by the passage of the pipeline pigs through the pipeline.

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26. (Previously presented) The apparatus as defined in Claim 25, wherein the separation zone is connected to a pipeline pig return line having a larger diameter which returns the pipeline pigs to the holding zone.

27. (Previously presented) The apparatus as defined in Claim 25, wherein the pipeline pigs are propelled at speeds which are a multiple of a fluid speed provided by the pressure system for the pipeline, thereby multiplying the capacity of the pipeline.

28. (Canceled)

29. (Currently amended) The apparatus as defined in Claim [[28]]25, wherein the electromagnetic thrust system includes electromagnetic motors, the electromagnetic motors being one of linear synchronous motors, linear motors, linear induction motors, linear electrodynamic motors, and pulsed linear induction motors.

30. (Currently amended) The apparatus as defined in Claim [[28]]25, wherein magnets are incorporated into the pipeline pigs.

31. (Original) The apparatus as defined in Claim 30, wherein the magnets are one of permanent magnets, electromagnets, induction magnets, and superconducting magnets.

32. (Previously presented) The apparatus as defined in Claim 25, wherein the pipeline pigs are one of rigid body, magnetorheological fluids (fluids that harden in the presence of a magnetic field and becomes liquid again when the magnetic field is removed), and ionized slugs of fluid.

33. (Canceled)

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34. (Currently amended) The apparatus as defined in Claim [[33]]25, wherein the coils are configured in one of multi-layered, pancake, flat plate or diamond.

35. (Currently amended) The apparatus as defined in Claim [[33]]25, wherein the coils incorporate ferromagnetic materials.

36. (Currently amended) The apparatus as defined in Claim [[33]]25, wherein the coils are applied to an outside of the pipeline.

37. (Currently amended) The apparatus as defined in Claim [[33]]25, wherein the coils are oriented in one of the following orientations: parallel to a longitudinal axis of the pipeline or fully encircling the pipeline perpendicular to the longitudinal axis of the pipeline.

38. (Withdrawn - currently amended) The apparatus as defined in Claim [[33]]25, wherein the coils are embedded in a pipeline liner.

39. (Currently amended) The apparatus as defined in Claim [[28]]25, wherein a power source used to power the electromagnetic thrust system is one of alternating current or direct current.

40. (Original) The apparatus as defined in Claim 39, wherein the power source is provided by one of connecting to an electric power grid or by generating the appropriate power adjacent to the pipeline.

41. (Original) The apparatus as defined in Claim 39, wherein a combination of transformer(s), rectifier(s), chopper(s) and inverter(s) are used to condition the power from the power source to provide multi-phased, variable voltage, variable frequency power.

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42. (Currently amended) The apparatus as defined in Claim [[28]]25, wherein a switching system is incorporated into the coil system such that energization of the coils is done in such a manner as to appropriately propel / suspend / hold the pipeline pigs and minimize power consumption.

43. (Previously presented) An apparatus for enhancing fluid velocity in a pipeline, comprising in combination:

pipeline pigs that block fluid flow through a pipeline by forming a seal with an inside surface of the pipeline and equipped with magnets capable of generating a magnetic field;

a pipeline having holding zone to load the pipeline pigs into the pipeline while preventing fluid flow through the holding zone and a separation zone in which the pipeline pigs are removed from the fluid flow, the separation zone being connected to a pipeline pig return line which returns the pipeline pigs to the holding zone;

an electromagnetic thrust system to provide guidance and suspension of the pipeline pigs, the electromagnetic thrust system including coils on the pipeline which provide an alternating current to the pipeline to induce a travelling magnetic field which interacts with the magnetic field in the pipeline pigs, propelling the pipeline pigs sequentially through the pipeline containing fluid at speeds which are a multiple of a fluid speed provided by a pressure system for the pipeline;

a switching system for selectively energizing the coils to propel the pipeline pigs through the pipeline; and

a controller for controlling pipeline pig velocities.

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